

X 2000.2

X 2400.2

GRAPHIC EDITIONS

BEDIENUNGSANLEITUNG
INSTRUCTION MANUAL

Dear customer

Congratulations on your purchase of this high-quality BRAX product.

You may be interested to know that we have been working now for 23 years in the development and production of top-quality high-end hifi components.

Within just a few years, we have succeeded in giving the BRAX brandname world wide recognition. Our efforts in creating these quality products have also been rewarded through the award of various honours by the major car audio magazines, not to mention numerous world wide innovation prizes.

In keeping with the tradition thus established, we have again provided our new BRAX amplifiers with everything they require in order to assume their rightful position as the pace-setters in the market. Offering the maximum possible level of engineering quality, they combine outstanding sound reproduction, solid craftsmanship and the noblest of materials to provide a completely new dimension in individuality.

We are proud to offer you this high-end product MADE IN GERMANY. and wish you many hours of enjoyment with your new BRAX amplifier.

AUDIOTEC FISCHER GMBH

Heinz Fischer

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Installation X2000.2 / X2400.2 / GRAPHIC EDITIONS

In order to maintain the quality of this product and ensure safe operation, we recommend that our amplifiers be installed by an authorized BRAX dealer. Installation by a qualified and accredited technician will qualify you for our special lifetime warranty. Your BRAX dealer will also assist you in selecting the correct additional components and in ensuring that proper consideration is given to all the safety and sound-related aspects.

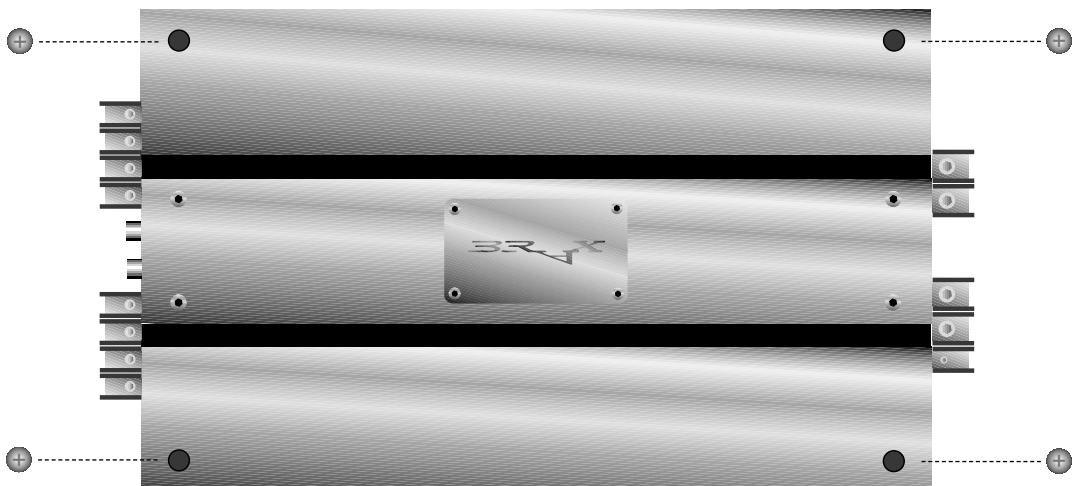
Important:

Before commencing installation, disconnect the car battery at the negative terminal. Once again we would urge you to have the installation work carried out by a specialist, as verification of correct installation and connection of the unit is a prerequisite for warranty cover of the BRAX by AUDIOTEC FISCHER Germany.

1. Install your amplifier at a dry location in the car where there is sufficient air circulation to ensure adequate cooling of the equipment. Also ensure that there is sufficient clearance available for making the cable connections and operating the controls.

2. For safety reasons, the amplifier must be secured in a professional manner. This is performed by means of four fixing screws (see Fig. 1) screwed into a mounting surface offering sufficient retention and stability. Before drilling the holes for the screws, carefully examine the area around the installation position and make sure that there are no electrical cables or components, hydraulic brake lines or any part of the petrol tank located behind the mounting surface - otherwise these could be damaged. You should be aware of the fact that such components may also be concealed in the double-skin trim panels/moldings.

Fig. 1
Installation in the car



Connection X2000.2 / X2400.2 / GRAPHIC EDITIONS

The above amplifier models may only be installed in motor vehicles which have a 12-volt negative terminal connected to the chassis ground. Any other system could cause damage to the amplifier and the electrical system of the vehicle.

The positive lead from the battery for the complete system should be provided with a line fuse at a distance of max. 30 cm from the battery. The amperage rating of the fuse is calculated from the maximum total current input of the car/vehicle hifi system.

Never bridge fuses or replace them with fuses with a higher amperage rating as such actions could lead to the destruction both of the amplifier and the entire electrical system of the vehicle.

As already mentioned, the negative lead from the vehicle battery to the chassis should be disconnected in order to prevent the occurrence of short-circuiting. Install the cabling in a manner which precludes any danger of the leads being exposed to shear, crushing or rupture forces. If there are sharp edges in the vicinity (e.g. holes in the body work), all the cables must be cushioned and protected to prevent fraying.

Never lay the power supply cables adjacent to leads and lines connecting other vehicle equipment (fan motors, fire detection modules, gas/petrol lines etc.).

In order to avoid cross-talk distortion, audio cables should never be laid together with electrical leads (with the exception of the screened BRAX POWER TRAX power supply cables).

In order to ensure safe installation, use only high-quality connection materials, and comply with the recommended minimum cross sections/gauge values of the cables for the individual amplifier modules.

As an aid to calculating the cross-sectional requirements of power cables which are not longer than 5 m, we advise a figure of max. 5 A per mm². For the X 1000 and X 1400 BRAX amplifiers described and for the X 2000 and X 2400 a minimum cross section of 20 mm² /gauge 5 for the positive 12-volt supply lead and for the ground (chassis) cable. In order to ensure optimum sound quality and interference-free music reproduction, we recommend that installation be performed with BRAX POWER TRAX power supply cables. The remote lead should have a cross section of at least 1 mm².

Connection of the power supply X2000.2 / X2400.2 / GRAPHIC EDITIONS

The **+12 volt power supply cable** (see Fig. 2) should be connected directly to the positive terminal of the battery. A fuse should also be provided at a distance of max. 30 cm from the battery. The amperage rating of the fuse is calculated from the maximum total current input of the car/vehicle hifi system.

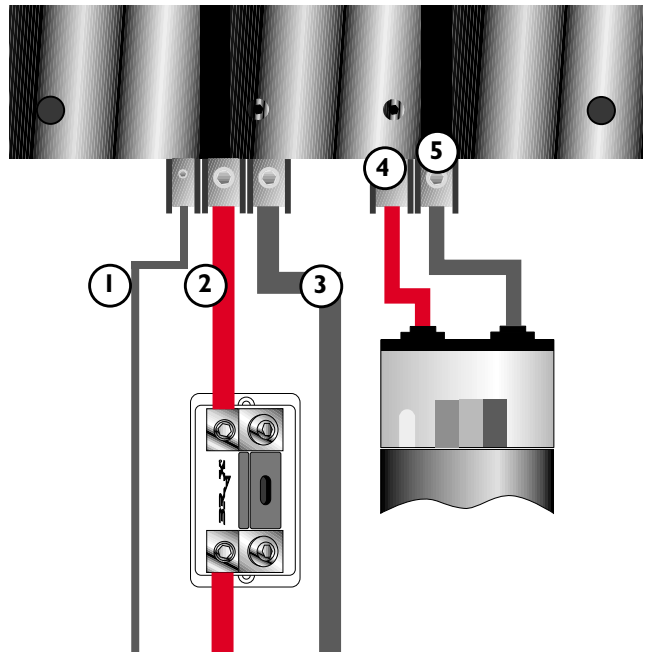
The fuse holder appertaining to the amplifier is supplied with the amplifier module. This must be installed at a distance of max. 20 cm from the positive terminal of the amplifier and equipped with the original BRAX fuse provided.

The fuse ratings are: for amplifier X 1000 = 60 A,
for amplifier X 1400 = 60 A,
for amplifier X 2000 = 100 A,
for amplifier X 2400 = 100 A.

Failure to comply nullifies the warranty.

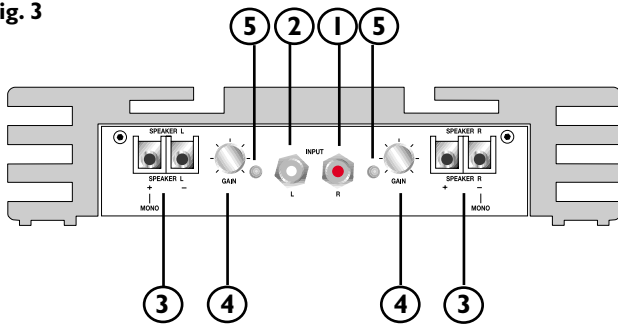
The ground (chassis) cable (see Fig. 2) should be connected to the central ground reference point (this is located where the negative terminal of the battery is grounded at the metal chassis of the vehicle), or to a bright bare-metal location on the vehicle chassis, i.e. an area which has been cleaned of all paint residues. It must be ensured that resistance values to the power sources (alternator, generator, battery) are minimized as excessive resistance can appreciably affect the audio quality and dynamics of the system. The „Remote“ cable (see Fig. 2) is connected to the „Remote“ connection or the automatic antenna connection of the control unit (tuner/radio). The antenna connection is only activated if the control unit is switched ON. This ensures that, with the control unit switched off, the amplifier is also switched off to save the battery.

Fig. 2



- ① Control lead (Remote)
- ② Positive (+) 12V cable via fuse to battery
- ③ Ground cable
- ④ Positive (+) connection BRAX Power Stabilizer
- ⑤ Negative (-) connection BRAX Power Stabilizer

Fig. 3



1-2 Signal Input

Signal input for the right (1) and left (2) channels. Both inputs are marked red. Connect using an RCA cable with cinch connectors.

3 Speaker Terminals

The speakers are connected here in accordance with the required configuration (see speaker connections). Cable sizes of up to 6 mm²/gauge 10 can be employed for this purpose.

4 Input Sensitivity Level Controller

The level controller enables the input sensitivity of the BRAX amplifiers to be adapted to the output voltage of the connected control unit (radio/tuner). **This controller is not a volume control.** Optimum setting of the level controller ensures you maximum audio enjoyment without those all-too-common audible distortions and overshoot phenomena which have such an adverse effect on sound quality.

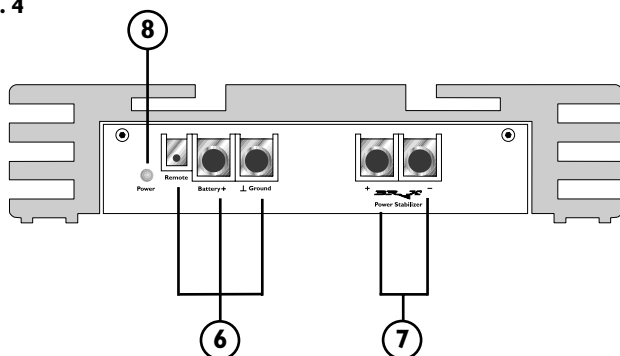
5 CPS-Colour Protection System

This shows the operating status of your amplifiers. When the amplifier module is switched on, both LED's change to green. This means that both channels of the module are operational. In the event of a malfunction in the amplifier module or a short circuit at the output, the LED for the defective or short-circuited channel switches to red. In the event of an amplifier channel overheating, the associated LED switches to red.

Green = operational; **Red** = malfunction in the amplifier, short circuit at the speaker output; overheating.

If the amplifier has tripped owing to overheating, it may take some time, depending on the ambient temperature, before it is re-activated.

Fig. 4



6 Power Supply Terminal

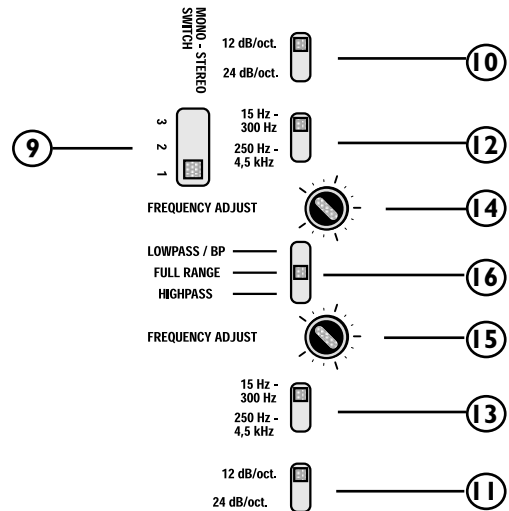
Terminal for connecting the positive 12-volt power supply cable, the ground/chassis lead and the remote lead.

7 External Connection for a BRAX Power Stabilizer

8 Power ON and Protection LEDs

The power ON LED lights up green when the amplifier is switched on. In the event of one of the two channels overheating, the LED switches to red.

Fig. 5



9 Mono-Stereo Selector

To set the operating mode of the amplifier:

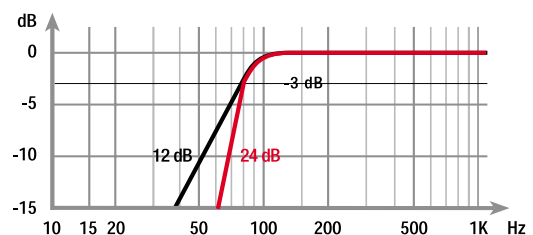
Position 1 - STEREO: If the amplifier operates in 2-channel mode the switch has to be set on stereo position and both inputs (1 and 2) must be used.

Position 2 - BRIDGED-STEREO: If the amplifier operates in Mono mode the switch has to be set on Bridged position. In this case both channels work as one (Mono) channel. **On the position „Bridged“ both inputs A and B (1 and 2) must be used.**

Position 3 - BRIDGED-MONO/CHL: As on position „BRIDGED-STEREO“ the amplifier operates in Mono mode where both channels work as one (Mono) channel. **In position „BRIDGED-MONO/CHL“ only input L (2) is used.** This is necessary when only one mono signal is available.

10-11 Slope Selector - 12dB/24 dB

To switch the crossover slope from 12 dB/octave auf 24 dB/octave.



12 Lowpass/Bandpass Frequency Selector

To switch the control range of the potentiometer (14) from 15 Hz to 300 Hz and from 250 Hz to 4500 Hz.

Fig. 7 Example: Lowpass 15 Hz - 300 Hz 12dB/octave

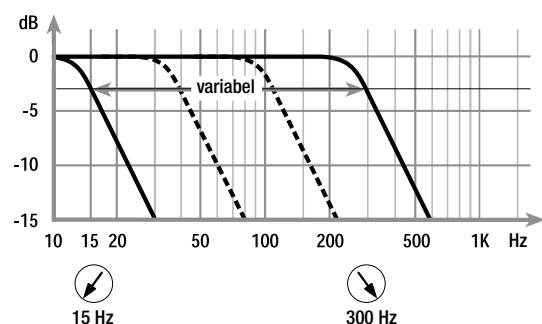
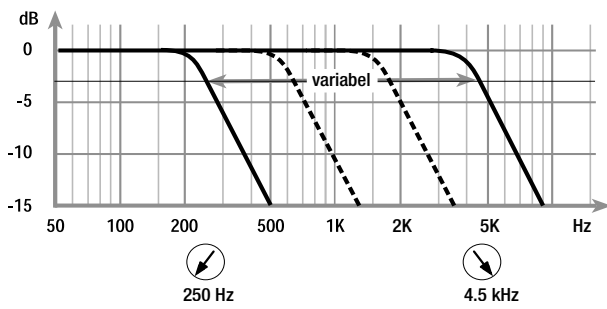


Fig. 8 Example: Lowpass 250 Hz - 4500 Hz 12dB/octave



13 Highpass Frequency Selector

To switch the control range of the potentiometer (15) from 15 Hz to 300 Hz and from 250 Hz to 4500 Hz.

Fig. 9 Example: Highpass 15 Hz - 300 Hz 12dB/Oktave

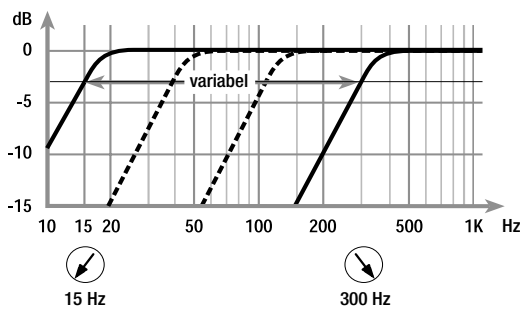
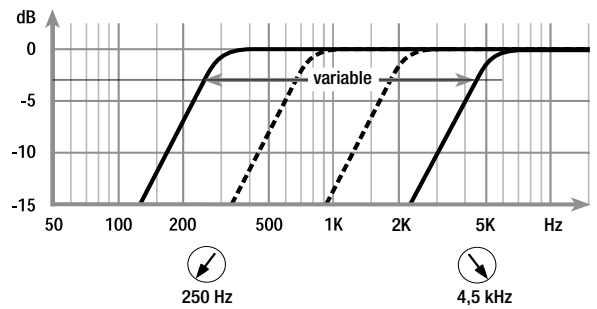


Fig. 10 Example: Highpass 250 Hz - 4500 Hz 12dB/octave



14 Control for frequency range Lowpass

To adjust the crossover frequency from 15 Hz to 4,5 kHz.

15 Control for frequency range Highpass

To adjust the crossover frequency from 15 Hz to 4,5 kHz.

16 Selector for Lowpass/Bandpass, Linear/Full Range) and Highpass

To switch the internal active crossover to Highpass / Full Range (linear) or Lowpass.

If this selector is set on **Highpass**, the frequency range can be adjusted with **selector 13** and the exact frequency can be adjusted with **control 15**. In addition the slope can be adjusted with **selector 11**.

At selector position **Lowpass/Bandpass** the Highpass is always active. That means a Bandpass is built in any case. With **selector 13** and **control 15** adjust the **Highpass** and with **selector 13** and **control 14** adjust the **Lowpass**. Thus every desired Bandpass between 15 Hz and 4500 Hz can be adjusted.

Caution! To avoid a loss of sound pressure make sure that the cross-over frequencies of High- and Lowpass are separated by 2 octaves when building a Bandpass.

That means: If the lowpass signal is adjusted to 320 Hz the highpass should be adjusted 2 octaves lower on approx. 80 Hz. (1 octave = double frequency or half frequency)

If a subwoofer is connected we recommend to use highpass control 20 as variable subsonic filter or to turn control 20 counter-clockwise to 15 Hz to get a subsonic filter.

Connection of speaker- and power cables X2000.2 / GRAPHIC EDITION

Fig. 11 2-Twin-channel/Stereo mode Switch 9 in position 1

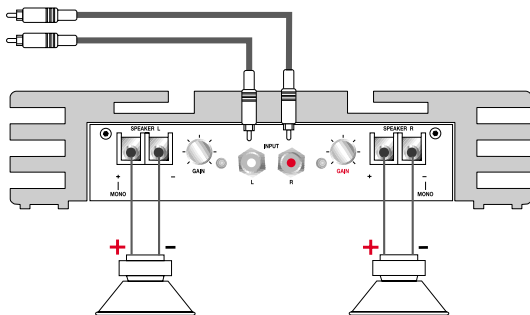


Fig. 12 Mono mode with stereo signal Switch 9 in position 2

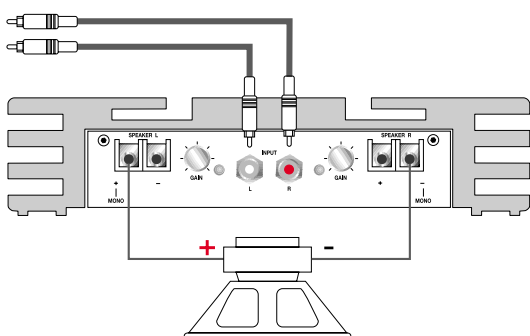
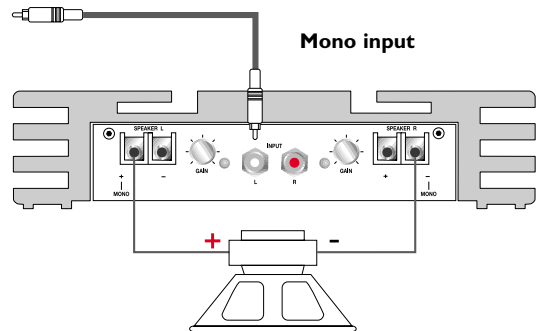


Fig. 13 Mono mode with mono signal Switch 9 in position 3

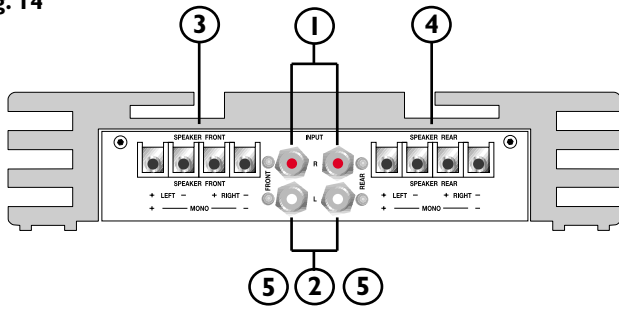


Important!

Never connect the speaker cables to the vehicle chassis. This can destroy your amplifier. Ensure that all the speaker systems are connected in-phase, i.e. plus to plus and minus to minus. The positive terminal is indicated on most speakers. In addition, the amplifiers may be operated in both the stereo(see Fig. 11) and mono (bridge) modes (see Fig. 12).

The mono/stereo selector switch is located at the bottom and can be operated once the metal cover has been removed. The function of the switch is described on a label at the bottom of the amplifier.

Fig. 14



1-2 Signal Input

Signal input for the right (1) and left (2) channels. Both inputs are marked red. Connect using an RCA cable with cinch connectors.

3-4 Speaker Terminals

The speakers are connected here in accordance with the required configuration (see speaker connections). Cable sizes of up to 6 mm²/gauge 10 can be employed for this purpose.

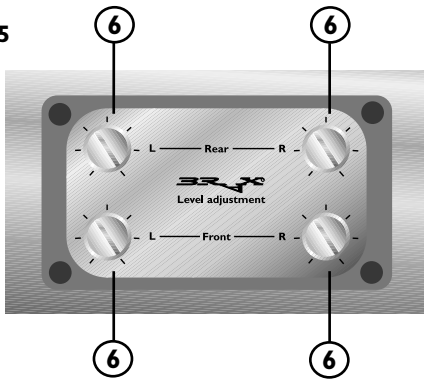
5 CPS-Colour Protection System

This shows the operating status of your amplifiers. When the amplifier module is switched on, both LED's change to green. This means that both channels of the module are operational. In the event of a malfunction in the amplifier module or a short circuit at the output or overheating, the LED for the defective or short-circuited channel switches to red.

Green = in operation; **Red** = malfunction in the amplifier, short circuit at the speaker output; overheating.

If the amplifier has tripped owing to overheating, it may take some time, depending on the ambient temperature, before it is re-activated.

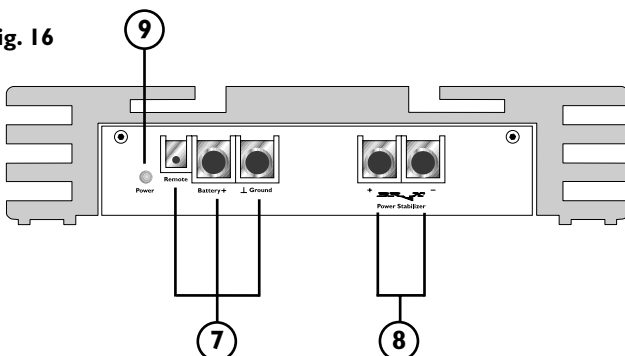
Fig. 15



6 Input Sensitivity Level Controllers

The level controllers enable the input sensitivity of the BRAX amplifiers to be adapted to the output voltage of the connected control unit (radio/tuner). **These controllers are not volume controls.** Optimum setting of the level controller ensures you maximum audio enjoyment without those all-too-common audible distortions and overshoot phenomena which have such an adverse effect on sound quality.

Fig. 16



7 Power Supply Terminal

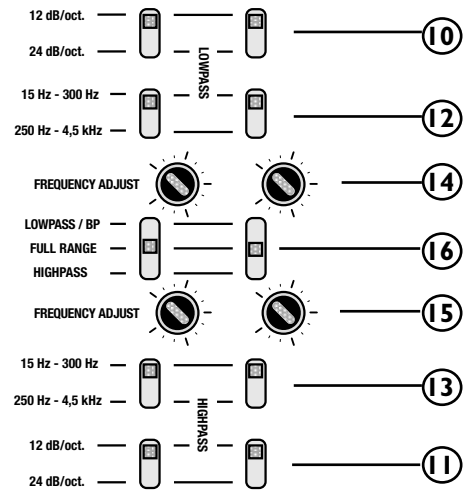
Terminal for connecting the positive 12-volt power supply cable, the ground/chassis lead and the remote lead.

8 External Connection for a BRAX Power Stabilizer

9 Power ON and Protection LEDs

The power ON LED lights up green when the amplifier is switched on. In the event of one of the two channels overheating, the LED switches to red.

Fig. 17



10-11 Slope Selector - 12dB/24 dB

To switch the crossover slope from 12 dB/octave auf 24 dB/octave.

12 Lowpass/Bandpass Frequency Selector

To switch the control range of the potentiometer (14) from 15 Hz to 300 Hz and from 250 Hz to 4500 Hz.

Examples: see page 11

13 Highpass Frequency Selector

To switch the control range of the potentiometer (15) from 15 Hz to 300 Hz and from 250 Hz to 4500 Hz.

Examples: see page 12

14 Control for frequency range Lowpass

To adjust the crossover frequency from 15 Hz to 4,5 kHz.

15 Control for frequency range Highpass

To adjust the crossover frequency from 15 Hz to 4,5 kHz.

16 Selector for Lowpass/Bandpass, Linear/Full Range) and Highpass

To switch the internal active crossover to Highpass / Full Range (linear) or Lowpass.

If this selector is set on **Highpass**, the frequency range can be adjusted with **selector 13** and the exact frequency can be adjusted with **control 15**. In addition the slope can be adjusted with **selector 11**.

At selector position **Lowpass/Bandpass** the Highpass is always active. That means a Bandpass is built in any case. With **selector 13** and **control 15** adjust the **Highpass** and with **control 14** adjust the **Lowpass**. Thus every desired Bandpass between 15 Hz and 6000 Hz can be adjusted.

Caution! To avoid a loss of sound pressure make sure that the crossover frequencies of High- and Lowpass are separated by 2 octaves when building a Bandpass.

That means: If the lowpass signal is adjusted to 320 Hz the highpass should be adjusted 2 octaves lower on approx. 80 Hz. (1 octave = double frequency or half frequency)

If a subwoofer is connected we recommend to use highpass control 20 as variable subsonic filter or to turn control 20 counter-clockwise to 15 Hz to get a subsonic filter.

Fig. 18
Switches are located at the bottom of the amplifier

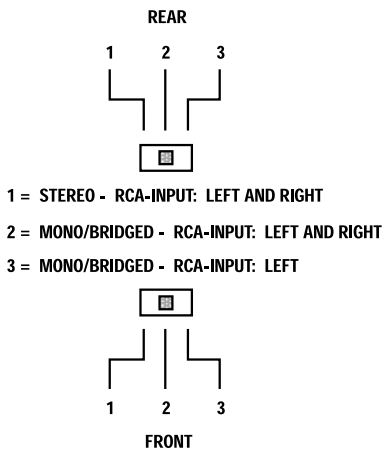


Fig. 18 Mono-Stereo Selector

To set the operating mode of the amplifier:

Position 1 - STEREO: If the amplifier operates in 4-channel mode the switch has to be set on "stereo" (1) position and both inputs (1 and 2) are used.

Position 2 - MONO/BRIDGED: If the amplifier is operated in mono mode with the front and rear channels the switch of either channel has to be set to the „Bridged-Stereo“ position (2). In this mode both channels work as one (Mono Rear or Mono Front). In position „Bridged-Stereo“ both inputs (1 and 2) of either bridged channel pair must be used.

Position 3 - BRIDGED-MONO/CHR: As on position „BRIDGED-STEREO“ the amplifier operates in Mono mode where both channels work as one (Mono channel). In position „BRIDGED-MONO/CHR“ only input L (2) is used. This is necessary when only one mono signal is available.

Connection of speaker- and power cables X2400.2 / GRAPHIC EDITION

Fig. 19 4-channel mode

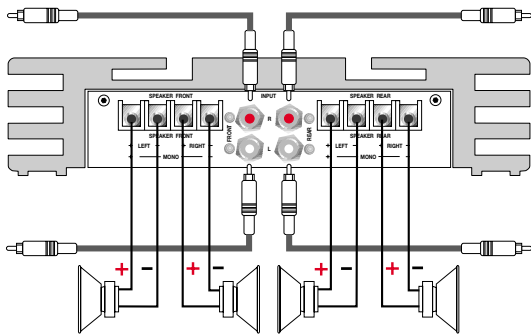


Fig. 22 2-channel mode with woofer stereo signal

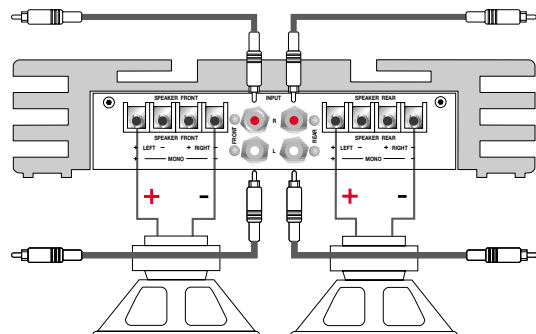


Fig. 20 3-channel mode with woofer stereo signal

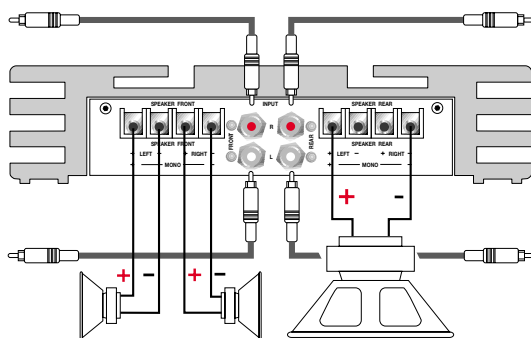


Fig. 23 2-channel mode with woofer mono signal

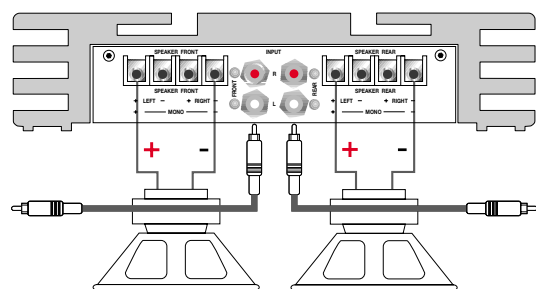
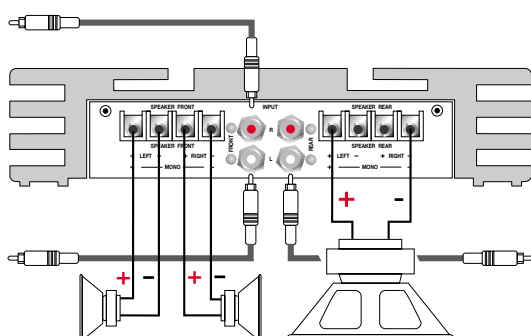


Fig. 21 3-channel mode with woofer mono signal



Important!

Never connect the speaker cables to the vehicle chassis. This can destroy your amplifier. Ensure that all the speaker systems are connected in-phase, i.e. plus to plus and minus to minus. The positive terminal is indicated on most speakers. In addition, the amplifiers may be operated in the stereo (see Fig. 22 / 23), 3-channel (see fig. 20 / 21) and 4-channel modes (see Fig. 19).

The mono/stereo selector switch is located at the bottom and can be operated once the metal cover has been removed. The function of the switch (stereo or mono) is described on a label at the bottom of the amplifier (see fig. 18)

Troubleshooting

SYMPTOM	POSSIBLE CAUSES	REMEDIES
The amplifier cannot be switched on.	12-volt positive supply lead line interrupted.	Check the power supply fuses and cabling.
	Amplifier not correctly connected to ground/chassis.	Check the connection to the chassis metal
	Power supply to the remote terminal interrupted.	Check the 12-volt remote output of your control unit (radio/tuner).
LEDs light up green but no sound can be heard.	The cinch input cables are not inserted, or the speakers are not connected.	Check that all the cables are properly inserted or screw-fixed.
	There is a faulty connection between the RCA terminal and the control unit.	Check the wiring and replace if necessary.
Only one channel is operating.	One channel may not be properly connected to the control unit or speaker.	Check the wiring connections, or swap the channels around.
	One channel has overheated - LED lights up red.	Turn the amplifier off and allow it to cool for a good while. Then switch it on again. If the LED is still showing red, consult your dealer.
	Speaker wiring is faulty (short circuit between the wires or with the chassis of the vehicle); LED lights up red.	Check the speaker wires and the speakers themselves for short-circuiting, and rectify as necessary.
	One speaker is faulty.	Replace the defective speaker with a new one.
Interference noise from the engine.	Parasitics in the cinch cable.	Check the connections (screen/shield).
	Parasitics in the power supply cabling.	Replace the cable with screened BRAX POWER TRAX cable. Consult your dealer.
	Feedback interference from the chassis to the control unit (radio/tuner).	Select an optimum central ground point to serve the entire power supply system of your vehicle, including the control unit (radio/tuner).

Please consult your dealer in relation to all other installation problems.

Once again we would ask you to have your dealer perform the installation work. He will be able to guarantee to you that this high-quality amplifier has been correctly installed. Moreover, verification of correct installation by specialist is a prerequisite for the lifetime warranty of your amplifier.

Technical Specifications

	X2000.2	X2400.2	X2000.2 GRAPHIC EDITION	X2400.2 GRAPHIC EDITION
Continuous power rating at 4 Ohm per channel	2 x 190 Watts	4 x 110 Watts	2 x 265 Watts	4 x 135 Watts
at 2 Ohm per channel	2 x 370 Watts	4 x 200 Watts	2 x 440 Watts	4 x 235 Watts
bridged into 4 Ohm load	1 x 740 Watts	2 x 400 Watts	1 x 880 Watts	2 x 470 Watts
Total harmonic distortion (THD)	< 0,002%	< 0,002%	< 0,001%	<0,001%
Signal to noise ratio	> 105 dB	> 105 dB	> 110 dB	>110dB
Damping factor at 4 ohms	> 400	> 400	>600	>400
Frequency response	20 Hz-20 kHz, +/- 0,2 dB	20 Hz-20 kHz, +/- 0,2 dB	20 Hz-20 kHz, +/- 0,2 dB	20 Hz-20 kHz, +/- 0,2 dB
TIM Distortion	< 0,016 %	< 0,014 %	< 0,009 %	< 0,009 %
Input Sensivity	300 mV-7,5 V	300 mV-7,5 V	300 mV-7,5 V	300 mV-7,5 V
External fuse size	100 A	100 A	100 A	100 A
Input impedance	10 kOhms	10 kOhms	10 kOhms	10 kOhms
Dimensions (H x W x D) in mm	53 x 238 x 470	53 x 238 x 470	53 x 238 x 473	53 x 238 x 473
Weight net.	7,4 kg	7,4 kg	8,2 kg	8,2 kg

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